

23-6-23/47

The Isotopic Exchange Between Some Organomercuric Compounds and Metallic Mercury  
Labeled by Hg<sup>203</sup>

topic exchange does not proceed over a state of equilibrium, but the metallic mercury directly reacts with the organomercuric R-HgX salt. Although the reaction probably is homolytic, it hardly proceeds over the stage of the formation of free radicals. The maintenance of the stereochemical configuration at the carbon atom which is connected with the mercury atom also speaks against the formation of free radicals. There are 1 table, and 4 references, 3 of which are Slavic.

ASSOCIATION:  
Moscow

State University imeni M. V. Lomonosov  
(Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova)

PRESENTED: October 26, 1957, by A. N. Nesmeyanov, Academician

SUBMITTED: October 24, 1957

AVAILABLE: Library of Congress

Card 3/3

PHASE I BOOK EXPLOITATION

858

Reutov, Oleg Aleksandrovich, Professor

Novyye sinteticheskiye materialy (New Synthetic Materials) Moscow, Izd-vo "Znaniye", 1958. 29 p. (Series: Vsesoyuznoye obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy. Seriya IV, 1958, No. 13) 86,000 copies printed.

Sponsoring Agency: Vsesoyuznoye obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy.

Ed.: Faynboym, I.B.; Tech. Ed.: Trofimova, A.V.

**PURPOSE:** This popular booklet is for the general reader.

**COVERAGE:** This pamphlet informs the reader on the new synthetic materials which play an important role in industry, technology, and in everyday life. Three main types of synthetics are discussed: rubber, plastics, and synthetic fibers. The basic characteristics of these materials are described as well as the fields of their application.

Card 1/2

858

New Synthetic Materials

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AVAILABLE: Library of Congress

TM/wal  
12-11-58

Card 2/2

5(3)

PHASE I BOOK EXPLOITATION

SOV/2917

Reutov, Oleg Aleksandrovich, Corresponding Member, USSR Academy of Sciences

Organicheskiy sintez i yego perspektivy (Organic Synthesis and Prospects for Its Development) Moscow, Gostekhizdat, 1958. 95 p.  
(Series: Nauchno-populyarnaya biblioteka) 500,000 copies printed.

Ed.: S.A. Shorygin; Tech. Ed.: A.P. Kolesnikova.

PURPOSE: This popular science booklet is intended for students and persons interested in the chemistry and technology of organic synthesis.

COVERAGE: This booklet explains the basic principles of organic chemistry and organic synthesis. Major products of synthesis are listed and the importance of carbon as the basic element of numerous chemical products is emphasized. Products obtained from coal and petroleum are discussed, and the role of natural gas and refinery gas in the production of synthetic material is explained. The production of synthetic rubber, fiber, resins, plastics, and drugs is briefly outlined. The author also reviews discoveries of Russian chemists such as A.M. Butlerov, N.N. Zinin, N.D. Zelinskiy, and M.G. Kucherov. In conclusion he notes the progress made in the field of synthetic material production, and points to further achievements. No references are given.

Card 1/3

organic Synthesis and Prospects (Cont.)

SOV/2917

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Organic Synthesis and Prospects (Cont.)

SOV/2917

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AVAILABLE: Library of Congress (QD262.R42)

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TM/gmp  
1-22-60

REUTOV, G. A., OSTAPCHUK, G. M., U Yan-Tsey, SMOLINA, T. A. and KNOL', P., (Moscow State University im. M. V. Lomonosov)

"The Use of Radioactive Mercury Hg for Studying the Exchange Reactions at a Carbon Atom." p. 29.

Isotopes and Radiation in Chemistry, Collection of papers of  
2nd All-Union Sci. Tech. Conf. on Use of Radioactive and Stable Isotopes and  
Radiation in National Economy and Science, Moscow, Izd-vo AN SSSR, 1958, 380pp.

This volume published the reports of the Chemistry Section of the  
2nd AU Sci Tech Conf on Use of Radioactive and Stable Isotopes and Radiation  
in Science and the National Economy, sponsored by Acad Sci USSR and Main  
Admin for Utilization of Atomic Energy under Council of Ministers USSR  
Moscow 4-12 Apr 1957.

REUTOV, O.A.

KARGIN, V.A.

5(3) 84 PHASE I BOOK EXPLOITATION SOV/1589

Academiya nauk SSSR.

Khimiya bol'shikh molekul; sbornik statey (Chemistry of Large Molecules; Collection of Articles) Moscow, Izd-vo AN SSSR, 1958. 299 p. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya seriya) 30,000 copies printed.

Compiler: O.V. Shlovskiy; Resp. Ed.: A.V. Topchiyev, Academician; Ed. of Publishing House: V.A. Boyarskiy; Tech. Ed.: I.B. Guseva.

REMARKS: This book is intended for a wide circle of readers including those who have had no training in chemistry. It can also serve as manual for propagandists, teachers, and journalists.

Card 1/8

# Chemistry of Large Molecules (Cont.)

SOV/1589

COVERAGE: This collection of articles reflects the trend for the future development of the Soviet chemical industry as indicated by the May plenary session of the Central Committee of the Communist Party within the framework of the seven-year plan. These articles were published in newspapers and journals. The authors, scientists and industry of the USSR, discussed the theme of accelerated development of the chemical industry and sciences, with stress on the manufacture of synthetic fibers, plastic, and other materials. Some of the articles were abridged, revised, or enlarged. The articles were selected so as to give an adequate survey of the chemistry and technology of high-molecular-weight compounds and their use in industry, agriculture, and in the manufacture of consumers' goods. Mention is made of new materials for the production of polymers. This book belongs to the popular-science series of the Academy of Sciences. Similar volumes are intended for future publication. No references are given.

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## Chemistry of Large Molecules (Cont.)

SOV/1589

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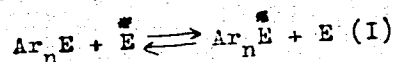
Card 1/8



AUTHORS: Reutov, O. A., Ptitsyna, O. A., SOV/156-58-1-27/46  
Karpov, T. P., Smolina, T. A.  
 TITLE: On the Reaction of the Isotope Exchange Between Tri-Aryl-  
 Stibines and Radioactive Antimony Sb<sup>124</sup> (O reaktsii izotopnogo  
 obmena mezhdur triarilstibinami i radioaktivnoy sur'moy Sb<sup>124</sup>)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Khimiya i khimicheskaya  
 tekhnologiya, 1958, Nr 1, pp. 115 - 116 (USSR)

ABSTRACT: The authors recently investigated the reactions of the type



(in which case E - is an n-valent element and E - its radio-  
 active isotope). These reactions are the most simple models for  
 reactions between metalorganic compounds and free metals (as  
 well as some non-metals); they are the basis of one of the most  
 important methods of synthesis of the metalorganic compounds  
 (Ref 1):  $m\text{Ar}_n\text{Me} + n\text{E} \rightarrow n\text{Ar}_m + m\text{Me} \quad (\text{II})$  (in which case Me - is  
 an n-valent metal and E - an m-valent metal). Naturally, the  
 rules which were determined with the exchange-reactions of the  
 type (I) may be of considerable importance for the further  
 development of the method of synthesis according to scheme (II).

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On the Reaction of the Isotope Exchange Between Tri-  
Aryl-Stibines and Radioactive Antimony Sb<sup>124</sup>

SOV/156-58-1-27/46

The exchange reaction  $\text{Ar}_3\text{Sb}^* + \text{Sb} \rightleftharpoons \text{Ar}_3\text{Sb} + \text{Sb}^*$  referred to in the title, takes place under rather severe conditions. Only when boiling a tetralin solution of triphenyl-stibine (at 207°) with a radioactive antimony powder, a 17% exchange took place within 5 hours. The petroleum fraction with a boiling temperature of from 190 to 200° was used as indifferent solvent in further tests. Tri-p-tolyl stibine was used as test material. Considerable divergences were observed in spite of several parallel tests: the equilibrium was established once at a 15%, once at a 30% and another time at an 80% exchange. Since the surface area of the metallic antimony forms one of the most important factors of the exchange. These diverging results indicate that this surface is in any way changed in the course of the reaction. Apparently, a recrystallization of the antimony powder takes place during its heating in petroleum at from 190 to 200° which is ended within approximately 30 hours. The estimation of surface area of a "reprepared" and a not re-prepared radioactive antimony powder shows 1,44 m<sup>2</sup>/g and 6,9 m<sup>2</sup>/g, respectively. The interaction of the "reprepared" radio-

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On the Reaction of the Isotope Exchange Between Tri-Aryl-Stibines and Radioactive Antimony  $Sb^{124}$

SOV/156-58-1-27/46

active antimony with tri-p-tolyl stibine in parallel tests lead to a conforming equilibrium exchange (15 to 16%) within 80 to 100 hours. There are 3 references, 2 of which are Soviet.

ASSOCIATION: Kafedra organicheskoy khimii Moskovskogo gosudarstvennogo universiteta im.M.V.Lomonosova (Chair of Organic Chemistry at the Moscow State University imeni M.V.Lomonosov)

SUBMITTED: October 26, 1957

Card 3/3

SOV/156-58-2-30/48

AUTHORS: ~~Reutov, O. A.~~, Smolina, T. A.,  
Wu Yang-ch'i, Bubnov, Yu. N.

TITLE: Isotopic Exchange of Several Organomercury Salts and  
Mercury Haloid Labelled by  $Hg^{203}$  (Izotopnyy obmen nekotorykh  
rtutnoorganicheskikh soley s galoidnoy rtut'yu, mechennoy  $Hg^{203}$ )

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya  
tekhnologiya, 1958, Nr 2, pp. 324 - 327 (USSR)

ABSTRACT: In continuation of previous papers the authors investigated  
the interaction between the mercury mentioned in the title  
and:  $\alpha$ -mercury bromo-cyclohexane, the ethyl- and 1-methyl-  
ether of the  $\alpha$ -mercury bromo-phenyl acetic acid, 3-mercury  
bromo-camphor, 3-benzyl-3-mercury bromo camphor, 1-mercury  
chloro-camphenylon, 2-mercury bromo camphane, and n.butyl-  
mercury bromide. The organomercury salts which are (except  
1-mercury chloro-camphenylon) oxo-compounds, react under  
mild conditions with mercury haloid. From the results (Table 1)  
appears that the reactivity of the investigated organomercury  
salts is reduced with respect to mercury haloid in a certain  
order (scheme given). 1-mercury bromo-camphenylon, 2-mercury

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Isotopic Exchange of Several Organomercury Salts and  
Mercury Haloid Labelled by  $\text{Hg}^{203}$

SOV/156-58-2-30/48

bromo camphane, and n.butyl-mercury bromide do not enter into the reaction of the isotopic exchange under these conditions. When the authors compared the results obtained by the reactions in benzene and dioxane to those in acetone they found that admixtures are contained in acetone which are not removed in the case of a normal dehydration. They are assumed to be responsible for the considerable fluctuations of the rate of reaction observed in acetone. The authors were able to prove that the reaction of the isotopic exchange is considerably accelerated by acids as well as by bases. It is possible that the bases lead to a solvation of the mercury atom and thus weaken the C—Hg bond. The influence of acids is probably specific only for the cases of the  $\alpha$ -mercurized oxo-compounds. The hydrogen of the acid probably influences the oxygen of the carbonyl group. This weakens the C—Hg bond. Apparently the isotopic exchange in question is a bimolecular reaction of the electrophilic substitution at the saturated carbon atom ( $\text{S}_\text{E} 2$ ). Further investigations in this respect are necessary. An experimental part follows. There are 1 table

Card 2/3

Isotopic Exchange of Several Organomercury Salts and  
Mercury Haloid Labelled by  $Hg^{203}$

SOV/156-58-2-30/48

and 1 reference, which is Soviet.

ASSOCIATION: Kafedra organicheskoy khimii Moskovskogo gosudarstvennogo  
universiteta im.M.V.Lomonosova (Chair of Organic Chemistry  
of the Moscow State University imeni M.V.Lomonosov)

SUBMITTED: October 28, 1957

Card 3/3

5(3)  
 AUTHORS: Reutov, O.A. and Lovtsova, A.N. SOV/55-58-3-23/30  
 TITLE: The Arylation of the Trichlorides of Diarylantimony by Salts  
 of the Diaryliodonium (Arilirovaniye trekhkhloristoy diari-  
 sur'my solyami diariiodoniya)  
 PERIODICAL: Vestnik Moskovskogo universiteta, Seriya matematiki, mekhaniki,  
 astronomii, fiziki, khimii 1958, Nr 3, pp 191-196 (USSR)  
 ABSTRACT: The cleavage of the binary iodonium salts of the trichloride  
 of diarylantimony and of the mixtures of diaryliodonium  
 chloride and diarylantimony-trichloride by zinc powder in  
 acetone was investigated. It was stated that triaryle anti-  
 monous organic combinations arise thereby.  
 There are 1 table, and 7 references, 3 of which are Soviet,  
 3 American, and 1 German.  
 ASSOCIATION: Kafedra organicheskoy khimii (Chair of Organic Chemistry)  
 SUBMITTED: June 17, 1957

Card 1/1

REUTOV, Oleg A., PRIZYNA, Olga A., and ERTEL, Gunter (all of Moscow)

"Neue Darstellungsmethode Antimonorganischer Verbindungen,"  
Chemische Technik, No. 4, Apr 1958.



SOV/156-58-4-36/49

AUTHORS:

Reutov, O. A.; Beletskaya, I. P., Filippenko, L. R.

TITLE:

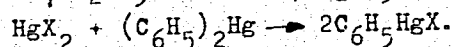
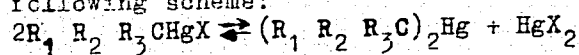
The Symmetrization of Mercury-Organic Salts by Means of Diphenyl Mercury (Simmetrizatsiya rtutnoorganicheskikh soley s pomoshch'yu difenilrtuti)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 754-756 (USSR)

ABSTRACT:

In the interaction of mercury-organic salts with mercury diphenyl, symmetric mercury-organic compounds are formed in great yield. The following mercury-organic salts were prepared: acetylmercury chloride, ethyl ester of the  $\alpha$ -bromo mercury phenyl acetic acid, ethyl ester of the  $n$ -bromo- $\alpha$ -bromo mercury phenyl acetic acid, 3-bromo-mercury-3-benzyl camphor and trans-chloro-vinyl-mercury chloride. The mechanism of the symmetrization of the mercury-organic salts proceeds according to the following scheme:



~~Ca 11/7~~

There are 1 table and 5 references, 4 of which are Soviet.

*Chair of Organic Chem, Moscow State U.*

15

5(3)

AUTHORS:

Reutov, O.A., Lu Chin-chu  
Bundel', Yu.G.

SOV/55-58-5-17/34

TITLE:

Synthesis of Some Optically Active Mercury-Organic Compounds  
of the Terpene Series (Sintez nekotorykh opticheski aktivnykh  
rtutnoorganicheskikh soedineniy ryada terpanov)

PERIODICAL:

Vestnik Morskovskogo universiteta, Seriya matematiki, mekhaniki, as-  
tronomii, fiziki, khimii, 1958, Nr 5, pp 111 - 118 (USSR)

ABSTRACT:

Mercurated derivatives of camphane and of menthane of the type  
 $R\text{HgX}$  and  $R_2\text{Hg}$  were synthetically produced, where R denotes  
bornyl, isobornyl or 1-menthyl. Diastereomers of 2-chloromercur-  
camphane were obtained in pure state which differ from each  
other only by the configuration in the second carbon atom. The  
main properties, particularly the crystallographic ones are  
given. The motive for the present paper were the investigations  
of A.N. Nesmeyanov. The method of I.A. Kondakov and I.A. Shindel'-  
mayzer [Ref 5] was used.

Card 1/2

*Chr. of Organic Chem*

AUTHOR:

Reutov, O. A.

SOV/62-58-6-5/37

TITLE:

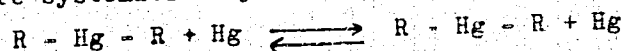
The Investigation of Electrophile and Homolytic Reactions of Substitution in the Carbon Atom by the Method of Isotope Exchange (Issledovaniye elektrofil'nykh i gomoliticheskikh reaktsiy zameshcheniya u atoma ugleroda metodom izotopnogo obmena) Lecture Delivered at the General Meeting of the Department of Chemical Sciences, AS USSR, on December 19, 1957 (Doklad na obshchem sobranii otdeleniya khimicheskikh nauk Akademii nauk SSSR 19 dekabrya 1957 g.)

PERIODICAL:

Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 6, pp. 684-692 (USSR)

ABSTRACT:

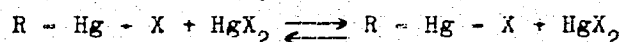
In the course of the investigation of the mechanism of the electrophile and homolytic reactions of **substitutions in saturated carbon atoms** (shown by the example of mercury-organic compounds) (Refs 1 - 6) the authors employed the method of isotope exchange. The following reactions of isotope exchange were systematically investigated:



Card 1/3

SOV' 62-50-6-5/37

The Investigation of Electrophile and Homolytic Reactions of Substitution in the Carbon Atom by the Method of Isotope Exchange. Lecture Delivered at the General Meeting of the Department of Chemical Sciences AS USSR on December 19, 1957



(R = Ar, Alk or ClCH=CH; X=Cl or Br. The radioactive mercury isotope  $Hg^{208}$  was used). Results obtained: Diaryl mercury and aryl mercury chlorides, enter into reaction (of isotope exchange) with metallic mercury  $Hg^{203}$  (under weak conditions). Electropositive substituents in para-position of the benzene ring facilitate reaction, but electronegative substituents render it more difficult. The homolytic reactions under investigation develop immediately between the molecules of the mercury-organic compounds and the molecules of mercury. Moreover, the dependence of the reaction velocities of the isotope exchange of the mercury organic salts (of the cyclic and alicyclic series with metallic mercury and sublimate) upon the structural factors (and additions of acid) was investigated. The homolytic and electrophile reactions of the isotope exchange of mercury-organic salts develop in such a

Card 2/3

SC7/62-58-6-5/37

The Investigation of Electrophile and Homolytic Reactions of Substitution in the Carbon Atom by the Method of Isotope Exchange. Lecture Delivered at the General Meeting of the Department of Chemical Sciences AS USSR on December 19, 1957

manner that the configuration is contained in saturated carbon. By investigating the isotope exchange of isomeric  $\beta$ -chloro-vinyl mercury-organic compounds (with Hg and  $HgCl_2$ ) the direct proof was obtained of the correctness of the rule<sup>2</sup> (set up by Nesmeyanov and Borisov) concerning the maintenance of stereochemical configuration in the olefine atom of carbon. There are 1 figure, 2 tables, and 15 references, 12 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: February 28, 1958

1. Carbon--Exchange reactions
2. Substitution reactions
3. Mercury chlorides--Exchange reactions
4. Mercury isotopes  
--Exchange reactions

Card 3/3

5(3)

AUTHORS:

Nesmeyanov, A. N., Reutov, O. A.,  
Loseva, A. S., Khorlina, M. Ya.

SOV/62-58-11-7/26

TITLE:

Synthesis of Organo-Mercury Compounds From Hydrazones  
(Sintez rtutnoorganicheskikh soyedineniy iz gidrazonov)  
Communication I. Interaction of Hydrazones of Aliphatic  
Aldehydes and Ketones With Mercury Acetate (Soobshcheniye 1.  
Vzaimodeystviye gidrazonov al'degidov i ketonov  
alifaticheskogo ryada s uksusnokisloy rtut'yu)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,  
1958, Nr 11, pp 1315-1326 (USSR)

ABSTRACT:

Earlier, hydrazones - a group of easily accessible compounds -  
have not been used for the synthesis of organometallic  
compounds. It is demonstrated in the present paper that the  
reaction of hydrazones of acetaldehyde, acetone, methyl-ethyl  
ketone, and butyrone with mercury acetate in aqueous methanol  
and absolute benzene medium may serve for the production of  
some new types of organo-mercury compounds. The reaction  
investigated takes place according to that of a "conjugated  
compound" under participation of the medium.

Card 1/3

$\alpha, \alpha'$ -dimercury or  $\alpha, \alpha', \beta, \beta'$ -tetramercury ether form in

Synthesis of Organo-Mercury Compounds From Hydrazones. SOV/62-58-11-7/26  
 Communication I. Interaction of Hydrazones of Aliphatic  
 Aldehydes and Ketones With Mercury Acetate

water,  $\alpha$ -mercury or  $\alpha, \beta$ -dimercury alkyl methyl esters in methanol, and  $\alpha$ -mercury or  $\alpha, \beta$ -dimercury alkyl acetates in absolute benzene. The chemical properties of the obtained organo-mercury compounds were investigated. It is demonstrated that a) dimercury compounds of the type (IV) - (VI) are decomposed by concentrated hydrochloric acid when heated. In this connection they separate calomel and form the corresponding carbonyl compounds b) bromination of dimercury compounds of the type (IV) - (VI) with a bromine solution saturated with potassium bromide leads in the cold to the formation of a corresponding  $\alpha$ -bromoketone at the same time with a ketone c) monomercury compounds of the type (I) - (III) are decomposed in the cold by concentrated alkali. On this occasion they separate metallic mercury and form the corresponding carbonyl compounds. There are 1 table and 10 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
 Card 2/3 (Moscow State University imeni M. V. Lomonosov)

5(3)

AUTHORS:

Nesmeyanov, A. N., Reutov, O. A.,  
Wu Yang-ts'u, Lu Ching-chu

SOV/62-58-11-8/26

TITLE:

On the Problem of the Stereochemistry of the Reaction  
Between Symmetric Organo-Mercury Compounds and Mercury  
Halide (K voprosu o stereokhimii reaktsii simmetrichnykh  
rtutnoorganicheskikh soyedineniy s galoidnoy rtut'yu)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,  
1958, Nr 11, pp 1327-1330 (USSR)

ABSTRACT:

In the present paper the authors investigated the  
stereochemistry of the reaction of symmetric  
 $\alpha$ -mercury-1-menthyl ester of phenyl-acetic acid and  
mercury bis- $\alpha, \alpha'$ -camphor with mercury bromide in acetone  
solution. Both reactions represent an electrophilic  
substitution with saturated carbon atoms. It was demonstrated  
that the first reaction in the cold takes place under main-  
tenance of the configuration at the touched carbon atom.  
Racemization observed at 56° is a secondary process.  
Stereochemistry of the reaction of mercury bis- $\alpha, \alpha'$ -camphor  
with mercury bromide could not be determined because the  
forming 3-bromomercury camphor racemizes under the action

Card 1/2



On the Problem of the Stereochemistry of the  
Reaction Between Symmetric Organo-Mercury  
Compounds and Mercury Halide

SOV/62-58-11-8/26

of mercury bromide during the reaction even in the cold.  
By the investigation of the reaction of symmetric  
 $\alpha$ -mercury-1-menthyl ester with an equimolecular amount  
of hydrogen bromide the conclusions which had already been  
drawn (Ref 1) were confirmed. Conclusions: the reaction  
in the course of which the organo-mercury salts become  
symmetric under the action of ammonia takes place at the  
saturated carbon atom under maintenance of the configuration.  
There are 4 references, 3 of which are Soviet

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: March 26, 1957

Card 2/2

5(3)

AUTHORS:

Nesmeyanov, A. N.; Rentov, O. A.;  
Ptitsyna, O. A.; Tsurkan, P. A.

SOV/62-58-12-6/22

TITLE:

Synthesis of Organometallic Compounds of Pentavalent Antimony  
by Arylation of the Organic Antimony Compounds  $\text{ArSbX}_2$  and  
 $\text{Ar}_2\text{SbX}$  by Diazo-Compounds (Sintez metalloorganicheskikh  
soyedineniy pyativalentnoy sur'my putem arilirovaniya  
sur'myanorganicheskikh soyedineniy  $\text{ArSbX}_2$  i  $\text{Ar}_2\text{SbX}$   
diazosoyedineniyami.)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,  
1958, Nr 12, pp 1435-1444 (USSR)

ABSTRACT:

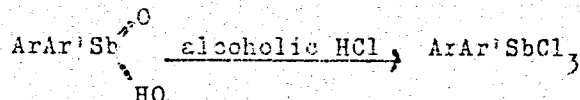
Published works give little data on the arylation of  
organic antimony compounds by means of diazo-compounds  
(Refs 4-7). In the present paper the authors investigated  
in detail the possibilities of arylating compounds of the  
type  $\text{ArSbX}_2$  and  $\text{Ar}_2\text{SbX}$  by means of diazo-compounds as well  
as of various diazonium double salts. They succeeded in  
finding such conditions under which the reaction of arylation  
can be carried out easily and in good yield. The method based

Card 1/3

Synthesis of Organometallic Compounds of Pentavalent Antimony by Arylation of the Organic Antimony Compounds  $\text{ArSbX}_2$  and  $\text{Ar}_2\text{SbX}$  by Diazo-Compounds

SOV/62-58-12-6/22

on the action of diazonium double salts of antimony trichloride on aryl-diiodo stibine proved to be a universal method for the synthesis of mixed organic antimony compounds of the type  $\text{ArAr}'\text{SbX}_3$ . The former are easily obtained from aryl stibine oxides. In almost all cases the reaction takes place at low temperatures and leads to the formation of the corresponding organic antimony compounds in very good yields. The compounds  $\text{ArAr}'\text{SbX}_3$  were isolated as diaryl antimoniac acid and identified as the diazonium double salts  $\text{ArAr}'\text{SbCl}_3 \cdot \text{Ar}''\text{N}_2\text{Cl}$  according to the method developed in reference 6:



Card 2/3

Synthesis of Organometallic Compounds of  
Pentavalent Antimony by Arylation of the Organic Antimony Compounds  $\text{ArSbX}_2$   
and  $\text{Ar}_2\text{SbX}$  by Diazo-Compounds

SOV/62-58-12-6/22

$\text{ArAr'SbCl}_3 + \text{Ar''N}_2\text{Cl} \cdot \text{FeCl}_3 \rightarrow \text{ArAr'SbCl}_3 \cdot \text{Ar''N}_2\text{Cl} + \text{FeCl}_3$ ,  
The results obtained are given in a table. The preparation  
method employed in synthesizing the substances of the types  
 $\text{ArAr'SbX}_3$  and  $\text{Ar}_2\text{Ar'SbX}_2$  is an important supplement of previous  
methods (Refs 2, 8-11) for the production of compounds of this  
type. There are 1 table and 16 references, 9 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni  
M. V. Lomonosova (Moscow State University imeni  
M. V. Lomonosova)

SUBMITTED: March 26, 1957

Card 3/3

REUTOV, O.A.; LOVTSOVA, A.N.

Arylation of diarylantimony trichloride with diaryliodonium salts. Vest.Mosk.un.Ser.mat.,mekh.,astron.,fiz.khim. 13 no.3: 191-196 '58. (MIRA 12:4)

1. Kafedra organicheskoy khimii Moskovskogo universiteta.  
(Arylation) (Antimony compounds)  
(Iodonium compounds)

AUTHORS: Reutov, O. A., Ptitsyna, O. A., Patrino, N. D. 79-28-3-5/61

TITLE: Double Diazo Salts of Stannic Trichloromethyl and of Stannic Dichlorodiethyl (Dvoynnye diazoniyevyye soli trekhkhlorigo metilolova i dvukhlorigo dietilolova)

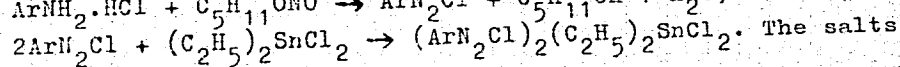
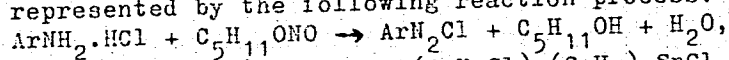
PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 3, pp. 588-592 (USSR)

ABSTRACT: According to a method for the synthesis of double diazo salts of antimony organic compounds (ref. 4) elaborated by one of the authors earlier, the authors in the present work carried out the synthesis of the double diazo salts of stannic trichloromethyl. These salts were synthesized by pouring together in the cold an acetone solution of the freshly produced  $\text{ArN}_2\text{Cl} \cdot \text{FeCl}_3$ -salt with the methyl alcohol solution of  $\text{CH}_3\text{SnOOH}$  which was saturated with hydrogen chloride:  $\text{CH}_3\text{SnOOH} + 3\text{HCl} \rightarrow \text{CH}_3\text{SnCl}_3 + 2\text{H}_2\text{O}$ ,  $2\text{ArN}_2\text{Cl} \cdot \text{FeCl}_3 + \text{CH}_3\text{SnCl}_3 \rightarrow (\text{ArN}_2\text{Cl})_2 \cdot \text{CH}_3\text{SnCl}_3 + 2\text{FeCl}_3$ . The salts  $(\text{C}_6\text{H}_5\text{N}_2\text{Cl})_2 \cdot \text{CH}_3\text{SnCl}_3$  and  $(p\text{-C}_6\text{H}_4\text{N}_2\text{Cl})_2 \cdot \text{CH}_3\text{SnCl}_3$ , and others

Card 1/3

Double Diazo Salts of Stannic Trichloromethyl and of Stannic Dichlorodiethyl  
79-28-3-5/61

could not be obtained in this way. Therefore an one-step method for the synthesis of the diazo salts of stannic trichloromethyl was elaborated as follows: the chloride solution of  $\text{CH}_3\text{SnOOH}$  was added to a diazo solution which had been obtained by diazotizing an aromatic amine in hydrochloric acid by means of sodium-nitrite - this immediately leading to a precipitate of  $(\text{ArN}_2\text{Cl})_3 \cdot \text{CH}_3\text{SnCl}_3$ -salt. The use of o-toluidine did not furnish any diazo salt. The double diazo salts of stannic trichloromethyl obtained according to either method are mentioned in table 1. In the synthesis of the double diazo salts  $(\text{C}_2\text{H}_5)_2\text{SnCl}_2$  another method had to be used: the chloride of the amine was dissolved in alcohol and then diazotized with isoamyl nitrite. The stannic dichlorodiethyl dissolved in alcohol was then added to the diazo solution. The formation of the double salt  $(\text{C}_2\text{H}_5)_2\text{SnCl}_2$  can be represented by the following reaction process:



Card 2/3

Double Diazo Salts of Stannic Trichloromethyl and of Stannic 79-28-3-5/61  
Dichlorodiethyl

synthetized this way are mentioned in table 2. There are  
2 tables and 5 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet  
(Moscow State University)

SUBMITTED: February 7, 1957

Card 3/3



REUTOV, O. A.

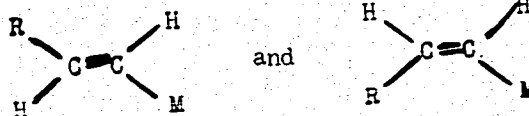
20-1-28/58

AUTHORS: Nesmeyanov, A. N., Academician  
Reutov, O. A., Knoll', P.

TITLE: The Employment of the Isotopic Method in Studying the Stereochemistry of Replacement Reactions at the Olefinic Carbon Atom (Izucheniye stereokhimii reaktsiy zameshcheniya u olefinovogo atoma ugleroda s pomoshch'yu izotopnogo metoda).

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 1, pp. 99-102 (USSR).

ABSTRACT: Together with Borisov the first author (reference 1) established the following rule: electrophile and homolytic replacement reactions take place under conservation of the cis- and trans-configuration. This rule was derived in the study of the metal exchange in the series of stereoisomeric organometallic compounds of the type:



By employing the method of isotopes the authors in this paper directly proved the correctness of this rule. As example of electrophile reactions they studied the interaction of trans- and cis-β-

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The Employment of the Isotopic Method in Studying the Stereochemistry of Replacement Reactions at the Olefinic Carbon Atom. 20-1-28/58

chlorovinyl-mercury chloride with sublimate labelled with radioactive mercury  $Hg^{203}$ . The reactions were carried out in an acetone solution in the cold. In both cases the isotopic equilibrium was soon obtained (within 5 minutes). The stereochemical initial configuration of the chlorovinyl group was on that occasion strictly conserved. As homolytical reactions they studied the interaction of metallic mercury labelled with  $Hg^{203}$  with trans- and cis- $\beta$ -chlorovinyl-mercury chlorides, as well as that with bis-trans- and bis-cis- $\beta$ -chlorovinyl-mercury. All 4 above-mentioned organo-mercury compounds readily react in acetone in the cold with finely distributed metallic mercury. The isotopic equilibrium is attained after some hours. The configuration of the chlorovinyl groups is always conserved in this connection. During the interaction of the metallic mercury with trans- and cis- $\beta$ -mercuryvinylchlorides a side reaction takes place under formation of calomel and acetylene. This is an example of the double reactivity which is so very characteristic of all  $\beta$ -chlorovinyl-organometallic compounds. The two electrophile and the two first homolytical reactions require an additional discussion. The observed stereochemistry of these 4 reactions was not the result of one but of several processes. It may be stated that these 4 reac-

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The Employment of the Isotopic Method in Studying the Stereochemistry 20-1-28/58  
of Replacement Reactions at the Olefinic Carbon Atom.

tions do not proceed over the equilibrium, but that  $\text{HgCl}_2$  and  $\text{Hg}$  directly react with the  $\beta$ -chlorovinyl-mercury chlorides. Thus the results obtained here are a direct proof of the conservation of the configuration at the olefinic carbon atom during the electrophile and homolytical replacement reactions. An experimental part with the usual data follows.

There are 4 references, 3 of which are Slavic.

ASSOCIATION: **Moscow State University imeni M.V. Lomonsov.** (Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova).

SUBMITTED: October 22, 1957.

AVAILABLE: Library of Congress.

Card 3/3

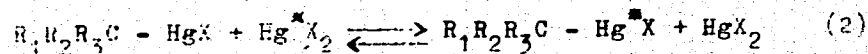
SOV/20-120-5-34/67

AUTHORS: Rentov, O. A., Enclil', P., Yan-Tsey U

TITLE: On the Stereochemistry of the Isotopic Exchange Reactions Between Organomercuric Salts and Metallic or Halogen Mercury Labelled With  $Hg^{203}$  (O stereokhimii reaktsiy izotopnogo obmena rtutnoorganicheskikh soley s metallicheskoj i galoidnoy rtut'yu, mechenaymi  $Hg^{203}$ )

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. ~~120~~<sup>120</sup>, Nr 5, pp.1052-1055 (USSR)

ABSTRACT: The authors explain the stereochemistry of the following reactions:  $R_1R_2R_3C - HgX + Hg^{203} \rightleftharpoons R_1R_2R_3C - Hg^{203}X + Hg$  (1) and



Reaction (1) represents the process of a homolytical reaction, (2) that of an electrophilic substitution at the saturated carbon atom. In the present paper the stereochemistry of reaction (1) is investigated on the basis of the diastomeric 1-methyl-ether of the mercury bromide phenyl acetic acid. Reaction (2) is explained on the basis of the cis- and trans isomer of the 2-methoxy-cyclohexyl-mercury chloride. Both

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SOV/20-120-5-34/67

On the Stereochemistry of the Isotopic Exchange Reactions Between  
Organomercuric Salts and Methyl or Halogen Mercury Labelled With  $Hg^{203}$

diastomers of the first substance react easily with atomized mercury at cold in a medium of absolute benzene. The stereometric configuration at the  $\alpha$ -carbon atom is in either case entirely conserved: the rotation angles of the diastomers before the reaction and after the establishment of the isotopic equilibrium were identical. This is another proof that these homolytical reactions are no free-radical-reactions, otherwise the reaction would be bound to lead to a racemization. The molecules of the organomercury compounds apparently react directly with the mercury molecules. Cis- and trans-2-methoxy-cyclohexyl-mercuric chlorides were chosen in order to clear the reaction stereochemistry. The reaction of the isotopic exchange was carried out in dioxane, acetone, and isobutyl alcohol. It proceeds with a noticeable velocity only at 120-135°. In all cases the initial stereochemical configuration of the substances was entirely maintained. The same results were obtained with all other investigated reactions of the electrophilic substitution at the saturated

Card 2/5

SOV/20-120-5-34/67

On the Stereochemistry of the Isotopic Exchange Reactions Between  
Organomercuric Salts and Metallic or Halogen Mercury Labelled With  $Hg^{203}$

carbon atom, except the cases reported by Cram (Kram, Ref 5).  
There are 5 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University imeni M. V. Lomonosov)

PRESENTED: February 26, 1958, by A. N. Mesmeyanov, Member, Academy of  
Sciences, USSR

SUBMITTED: February 26, 1958

1. Mercury isotopes--Exchange reactions
2. Mercury compounds
- (Organic)--Exchange reactions
3. Mercury salts--Exchange reactions
4. Mercury compounds (labeled)--Exchange reactions
5. Stereochemistry

Card 3/3

AUTHORS: Nesmeyanov, Nik. A., Reutov, O. A. 20-120-6-28/59

TITLE: Functional Derivatives of Ferrocene-1,1'-Dicarboxylic Acid  
(Funktsional'nyye proizvodnyye ferrotsen-1,1'-dikarbonovoy kisloty)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 120, Nr 6,  
pp 1267 - 1270 (USSR)

ABSTRACT: Although the acid mentioned in the title was produced already in 1952 (Ref 1) its derivatives remained unknown with two exceptions (Refs 1,2). In the present paper the authors obtained a number of these derivatives. They are: a) the chlorine anhydride b) from the latter an amide (V) was produced, c) methyl ether of the carbamido-ferrocene-1'-carboxylic acid (VII); d) the above amides (V), and (VII) as well as the amide of ferrocene carboxylic acid can be converted into the corresponding nitriles by heating in acetic anhydride. By heating the acid (VII) at 140° for 20 minutes e) 1-cyano ferrocene-1'-carboxylic acid (VIII) formed in a yield of 55%; f) the nitrile of ferrocene-1,1'-dicarboxylic acid (IX) was obtained in a yield of 30% by heating the amide of this acid in acetic anhydride at 100° during 6 hours; g) by heating the amide of ferrocene carboxylic acid in acetic anhydride at 140° during 40 minutes the nitrile of this

Card 1/8  
2

Functional Derivatives of Ferrocene-1,1'-Dicarboxylic Acid 20-120-6-28/59

acid formed (X); h) a cleavage of the HCl elements from the 2 chlorine anhydride molecules as well as from 2 water molecules takes place under the formation of the anhydride of the ferrocene-1,1'-dicarboxylic acid (XI) due to the action of pyridine on chlorine anhydride (IV) in the presence of water. Constants are given of all substances mentioned and their structure is discussed. According to the aromatic character of ferrocene it was found that the radical  $-\text{CCl}_3$  may replace one of the ferrocene hydrogens. In spite of the variation of the decomposition conditions of trichloroacetic acid in the mixture with ferrocene no products of a double trichloromethylation of ferrocene could be observed. There are 1 table and 7 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

PRESENTED: February 11, 1958, by A.N.Nesmeyanov, Member, Academy of Sciences, USSR

Card 2/2

2



5(2), 5(3)

AUTHORS: ~~Reutov, O. A.~~, Corresponding Member, SOV/20-122-5-21/56  
Academy of Sciences, USSR, Ptitsyna, O. A., Khu Khun-Ven

TITLE: The Synthesis of Organomercuric Compounds by Means of  
Diaryl Iodonium Salts (Sintez rtutnoorganicheskikh soedineniy  
cherez soli diarylyodoniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 5,  
pp 825-827 (USSR)

ABSTRACT: As was formerly proved by the authors (Refs 1, 2), the double  
salts of diaryl iodonium can serve as a source for the  
production of organo-metallic compounds of tin, antimony and  
bismuth. The reaction consists of a decomposition of diaryl  
iodonium double salts by tin, antimony or bismuth powders,  
respectively. The paper under review deals with the possibility  
of applying this reaction to the synthesis of organomercuric  
compounds. In order to find optimum conditions, the authors  
decomposed the corresponding double salt of diphenyl-iodonium  
chloride sublimate in various solvents. Hg, Fe, Zn, Cu and Ag  
were used as reducing factors. The results are given in table 1.  
They show that the main product of reaction is diphenyl mercury

Card 1/2

The Synthesis of Organomercuric Compounds by Means  
of Diaryl Iodonium Salts

SOV/20-122-5-21/56

when iron is used. In all other cases it was  $C_6H_5HgCl$ . Silver decomposes the double salt  $(C_6H_5)_2JCl.HgCl_2$  by forming diphenyl-iodonium chloride and calomel; no organomercuric compounds are created. The maximum yield of phenyl mercury chloride is obtained in the decomposition of the double salt of diphenyl-iodonium chloride sublimate by mercury in water. Because of various short-comings in the use of silver salts, the authors decided to use diphenyl iodonium salts for the synthesis of organomercuric compounds. As can be seen in table 3, a high yield of organomercuric compounds is formed by means of diaryl iodonium salts. Also the comparatively easy accessibility of these salts, as well as the simple process of the synthesis speak in favor of the method suggested. There are 3 tables and 4 references, 2 of which are Soviet.

SUBMITTED: July 5, 1958

Card 2/2

5(1, 2)

AUTHORS:

Reutov, O. A., Corresponding

SOV/20-122-6-21/49

Member, AS USSR, Ptitsyna, O. A., Styazhkina, N. B.

TITLE:

Decomposition of Asymmetric Diaryliodonium Salts by Bismuth Powder in the Presence of Bismuth Trichloride  
(Razlozheniye nesimmetrichnykh soley ~~diariliodoniya~~ poroshkom vismuta v prisutstvii trekhkhlorigo vismuta)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 6, pp 1032-1034 (USSR)

ABSTRACT:

The first two authors have demonstrated in an earlier paper (Ref 1) that in the decomposition of the diaryliodonium chlorides by tin powder in the presence of tin dichloride organotin compounds are formed in good yield. Furthermore it was demonstrated that in the decomposition of unsymmetric salts of diaryliodonium of the type  $ArAr'JCl$  under same conditions the more intensely electronegative radical passes from iodine to tin. All these reactions obviously pass through the preliminary stage of the formation of double iodonium salts of tin dichloride, which are decomposed by tin powder. In the same paper (Ref 1) the possibility of forming organobismuth compounds was shown. They are formed by

Card 1/3

Decomposition of Asymmetric Diaryliodonium Salts by Bismuth Powder in the Presence of Bismuth Trichloride SOV/20-122-6-21/49

decomposition of double salts of diaryliodonium chloride and of bismuth trichloride by bismuth powder. For reasons of preparation it has turned out to be more practical not to decompose a double salt by bismuth but to decompose a mixture of  $Ar_2JCl$  and  $BiCl_3$ . For example, the yield of triphenyl bismuth will be 35-40 % under these conditions. The reactions taking place in connection with this are explained by equations. The unsymmetric salts decomposed by the method described are given in table 1 together with the substances produced in this process. As can be seen from it, the more intensely electronegative radical passes in all cases to bismuth. In no case it was possible to isolate a second substance. Apparently it is formed in such small quantities which could only be detected by means of chromatography, e. g. The results obtained are difficult to understand as the quantity of the electron density does not represent a determinative factor in radical reactions (Ref 1), even if it is maintained that the decomposition of double radicals takes place "homolytically". At the same time the regularity observed here in the transition

Card 2/3

Decomposition of Asymmetric Diaryliodonium Salts by SOV/20-122-6-21/49  
Bismuth Powder in the Presence of Bismuth Trichloride

of the more intensely electronegative radical to the metal can easily be explained by the assumption of a heterolytic decomposition of the iodonium double salts. Although in recent times more and more knowledge of a certain role of the polar factors in the radical reactions has been collected, all data described by the authors give evidence of the heterolytic mechanism of the decomposition reactions of the iodonium salts which are discussed here. There are 1 table and 6 references, 1 of which is Soviet.

SUBMITTED: July 5, 1958

Card 3/3

NESMEYANOV, Aleksandr Nikolayevich, akademik; REUTOV, O.A., otv.red.toma;  
TOPCHIEV, A.V., akademik, red.; KNUNYANTS, I.L., akademik, red.;  
KABACHNIK, M.I., akademik, red.; FREYDLINA, R.Kh., red.; KAN, B.I.,  
red.; LOSKUTOVA, I.P., red.izd-va; POLYAKOVA, T.V., tekhn.red.

[Selected works in four volumes] Izbrannye trudy v chetyrekh tomakh.  
Moskva, Izd-vo Akad.nauk SSSR. Vol.1. 1959. 712 p. (MIRA 12:12)

1. Chleny-korrespondenty AN SSSR (for Reutov, Freydlina).  
(Chemistry)

REUTOV, O. A.

"Formation Mechanism of the Metal-Carbon Compound and Some Aspects of the Reaction Capacity of Metal Organic Compounds of Heavy Metals."

report to be submitted at the 17th International Congress of Pure and Applied Chemistry - Munich, GFR, 30 Aug - 6 Sep 1959.

5(3)

SOV/62-59-1-8/38

AUTHORS:

Nesmeyanov, A. N., Reutov, O. A., Loseva, A. S.,  
Khorlina, M. Ya.

TITLE:

Synthesis of Organo-Mercury Compounds From Hydrazones  
(Sintez rtutnoorganicheskikh soedineniy iz gidrazonov)  
Communication 2. Interaction of Hydrazones of the Aldehydes  
and Ketones of the Alicyclic and Aromatic Series With  
Mercury (II) Acetate (Soobshcheniye 2. Vzaimodeystviye gidra-  
zonov al'degidov i ketonov alitsiklicheskogo i aromatches-  
kogo ryadov s uksusnokisloy rtut'yu)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,  
1959, Nr 1, pp 50 - 61 (USSR)

ABSTRACT:

In the present paper the authors have shown that the hydra-  
zones of aldehydes and ketones of the alicyclic and aromatic  
series (hydrazones of cyclohexanone, 4-methyl cyclohexanone,  
cyclopentanone, camphor, benzophenone and o-nitro-benzalde-  
hyde) react with mercury (II) acetate in water, methanol  
and absolute benzene and separate nitrogen, mercury (I)  
acetate and metallic mercury, and form organo-mercury com-  
pounds. In most cases the reaction under the action of

Card 1/1

2



Synthesis of Organo-Mercury Compounds From Hydrazones. SOV/62-59-1-8/38  
 Communication 2. Interaction of Hydrazones of the Aldehydes and Ketones  
 of the Alicyclic and Aromatic Series With Mercury (II) Acetate

the solvent takes place in the way mentioned in Ref 1 .  
 The reaction of hydrazones of cyclohexanone and 4-methyl  
 cyclohexanone with mercury (II) acetate in water and in  
 the presence of catalytic quantities of copper acetate is  
 very peculiar. As a result of this interaction organo-  
 mercury compounds with a double bond are formed. Organo-  
 mercury compounds are listed in the table which were  
 synthesized by way of hydrazones of the alicyclic and aro-  
 matic series. The structure of the organo-mercury compounds  
 obtained was confirmed by decomposition with concentrated  
 alkali or concentrated hydrochloric acid (Ref 1). The  
 hydrazones used in this paper were synthesized according to  
 methods already described: hydrazone of cyclohexanone  
 (Ref 2), of 4-methyl cyclohexanone (Ref 3), of camphor  
 (Ref 4), of benzophenone (Ref 5) and o-nitro-benzaldehyde  
 (Ref 6). There are 1 table and 14 references, 2 of which  
 are Soviet.

Card 2/3

5(3)

AUTHOR:

Reutov, O. A., Corresponding Member AS USSR SOV/30-59-1-28/57

TITLE:

Symposium on Theoretical Organic Chemistry (Simposium po teoreticheskoy organicheskoy khimii)

PERIODICAL:

Vestnik Akademii nauk SSSR, 1959, Nr 1, pp 114 - 115 (USSR)

ABSTRACT:

This symposium was held in memory of A. Kekule in London from September 15 until September 17, 1958. It had been organized by the British Chemical Society and the Department of Organic Chemistry of the International Association for Theoretical and Applied Chemistry. 600 chemists from 25 countries participated. 3 lectures and 15 reports were heard. All mentioned reports were held by western scientists.

Card 1/1

SOV/156-59-1-35/54

5(3)

AUTHORS:

Ptitsyna, G. A., Reutov, G. A., Turchinskiy, M. F.

TITLE:

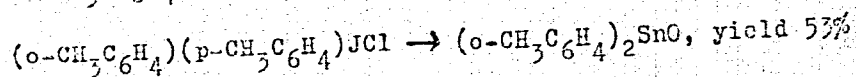
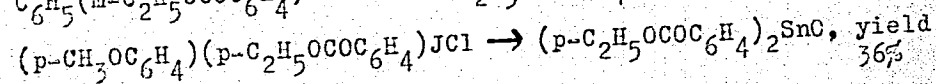
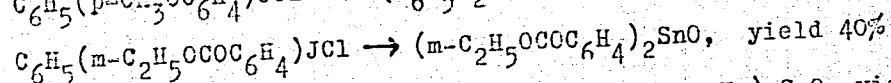
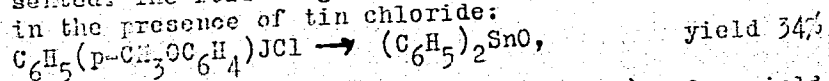
The Decomposition of Asymmetric Salts of Diaryl Iodonium by Tin Powder in the Presence of Tin Dichloride (Razlozheniye nesimmetrichnykh soley diariliodoniya poroshkom olova v prisutstvi dvukhloristogo olova)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1959, Nr 1, pp 138 - 140 (USSR)

ABSTRACT:

A method for the synthesis of organic tin compounds is presented. The following compounds were treated with tin powder in the presence of tin chloride:



Card 1/2

The Decomposition of Asymmetric Salts of Diaryl Iodonium SOV/156-59-1-35/54  
by Tin Powder in the Presence of Tin Dichloride

The compounds obtained and their yields are listed in a table. In all cases, the more electro-negative radical attached itself to the tin. No tin compounds were obtained on the decomposition of iodonium salts containing nitro-groups. In these compounds intensive resinification occurred which may be due to reduction processes of the nitro-groups. The experimental part of the paper presents the reaction details, as well as those of the production of the iodonium salts, with regard to laboratory work. There are 1 table and 5 references, 2 of which are Soviet.

ASSOCIATION: Kafedra organicheskoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chair of Organic Chemistry of Moscow State University imeni M. V. Lomonosov)

SUBMITTED: July 10, 1958

Card 2/2

5(4)

AUTHORS:

Reutov, O. A., Smolina, T. A.,  
~~Hu Hung-weng~~

SOV/62-59-3-33/37

TITLE:

None Given

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,  
1959, Nr 3, pp 559-560 (USSR)

ABSTRACT:

In this letter to the editor the authors write: We have found that organic mercury compounds may enter the reaction of an isotopic exchange of the following type under soft conditions:

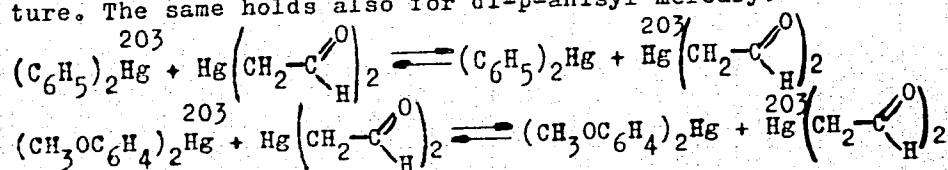
$$R_2^{203}Hg + R_2^{200}Hg \rightleftharpoons R_2^{200}Hg + R_2^{203}Hg$$
 In pyridine the half period of exchange in the reaction of equimolecular amounts of diphenyl mercury with di-p-chlorophenyl mercury (concentration of the substances - 0.03 mol/l) at 60° is 3 hours.

$$(C_6H_5)_2^{203}Hg + (ClC_6H_4)_2^{200}Hg \rightleftharpoons (C_6H_5)_2^{200}Hg + (ClC_6H_4)_2^{203}Hg$$
 At room temperature di-p-chlorophenyl mercury in acetone solution with mercury-bis-acetaldehyde - a substance with an extremely reactive mercury atom - does not enter the reaction of isotopic exchange. In the interaction between diphenyl mercury and

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mercury-bis-acetaldehyde, however, the isotopic equilibrium in acetone is practically immediately produced at room temperature. The same holds also for di-p-anisyl mercury.



At present there are no data available which would allow a definite judgement of the mechanism of the discovered isotopic exchange. It may be assumed that the reaction is not free-radical because free radicals cannot form from organic mercury compounds under such soft conditions.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: November 17, 1958

Card 2/2

5(3)  
AUTHORS:

Reutov, O. A., Uglova, E. V.

SOV/62-59-4-39/42

TITLE:

Letter to the Editor (Pis'ma redaktoru)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,  
1959, Nr 4, p 757 (USSR)

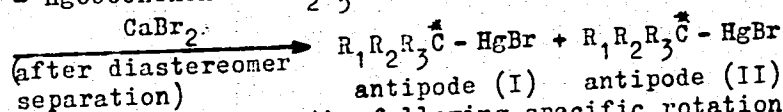
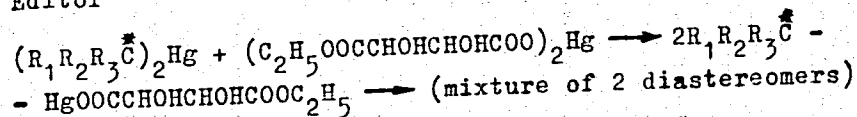
ABSTRACT:

The authors write in this letter: "The possibility of the existence of a constant stereochemical configuration of the carbon atom combined with metal in the case of the molecule having a single asymmetrical center has as yet not been experimentally proved. We were successful in proving it by separating for the first time the racemic mercury salts 2-bromomercurybutane and 5-bromomercury-2-methylhexane in antipodes. Alkylmercury bromide was made symmetrical with sodium stannite and dialkyl mercury was treated with the mercury salt of the monoethyl ester of the d-tartaric acid. The organic mercury diastereomers obtained were separated by crystallization and the residue of the optically active acid in the diastereomer was substituted by bromine by the effect of  $\text{CaBr}_2$

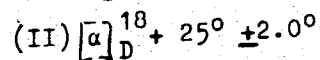
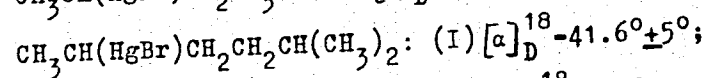
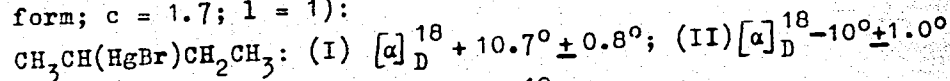
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Letters to the Editor

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The antipodes have the following specific rotation (in chloroform;  $c = 1.7$ ;  $l = 1$ ):



It might be quite possible that we did not obtain a complete but only a partial separation of the racemates. Also, it is obvious that in the second case we did not obtain the antipode (II) in a pure state. It has to be noted that the possibility of the existence of constant organic mercury antipodes follows from the results of our previous investigations on the preparation of organic mercury diastereomers

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Letters to the Editor

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distinguished only by the configuration of the carbon atom combined with mercury (Ref 1)." There are 3 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: December 17, 1958

Card 3/3

5(3)

SOV/62-59-5-27/40

AUTHORS:

Nesmeyanov, Nik. A., Reutov, O. A.

TITLE:

The Derivatives of 1-Carboxyferrocene-1'-Sulfonic Acid  
(Proizvodnyye 1-karboksiferrotsen-1'-sul'fonovoy kisloty)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,  
1959, Nr 5, pp 926-929 (USSR)

ABSTRACT:

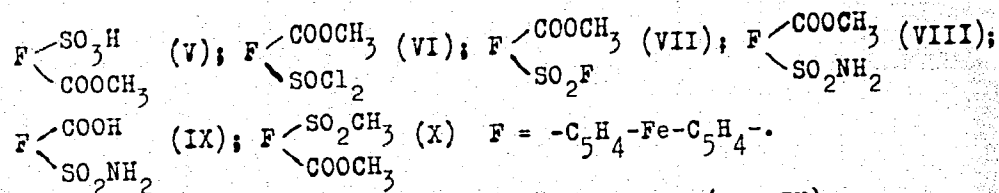
In an earlier paper (Refs 1,2) the authors synthesized a number of ferrocene carboxylic acids of the general formula  $Y-C_5H_4-Fe-C_5H_4-COOH$ , and on this basis they investigated the influence exercised by the substituent Y upon the acetic character of ferrocene carboxylic acid. The same influence was investigated also in the present paper, but stronger electro-negative substituents were used. For this purpose, the ferrocene carboxylic acid and its methyl ester were sulfonated and the derivatives of the acid already mentioned in the title were investigated. The following 10 derivatives were obtained:

$F \begin{smallmatrix} \text{COOH} \\ \text{SO}_3 \end{smallmatrix}$  (I);  $F \begin{smallmatrix} \text{COCl} \\ \text{SOCl}_2 \end{smallmatrix}$  (II);  $F \begin{smallmatrix} \text{CONH}_2 \\ \text{SO}_2\text{Cl} \end{smallmatrix}$  (III);  $F \begin{smallmatrix} \text{COOH} \\ \text{SO}_2\text{F} \end{smallmatrix}$  (IV);

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SOV/62-59-5-27/40

The Derivatives of 1-Carboxyferrocene-1'-Sulfonic Acid



The dissociation constants of several acids (IV, IX) were determined and compared with those of reference 2. This showed that by the presence of a sulfamide substituent the acidity of ferrocene carboxylic acid is increased 5.5-fold and by that of a sulfofluoride substituent even 9-fold (Table 2). This is indicative of the considerable influence exercised by the substituent upon the carboxyl group, which is on the other ring of the ferrocene molecule. There are 1 table and 2 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: September 10, 1958

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5(3)

SOV/62-59-9-37/40

AUTHORS: Reutov, O. A., Shatkina, T. N.

TITLE: Rearrangement of the Free Propyl Radical

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 9, pp 1690-1691 (USSR)

ABSTRACT: The authors found that the free propyl radical formed by thermal decomposition of n-butyric peroxyde in  $\text{CCl}_4$ , by rearrangement can change the position of the carbon atoms in the chain:  
 $\text{CH}_3\text{-CH}_2\text{-}\overset{*}{\text{CH}}_2\text{-}\longrightarrow\text{-}\overset{*}{\text{CH}}_2\text{-}\overset{*}{\text{CH}}_2\text{H-CH}_3$ . The rearrangement was verified in the following manner: n-butyric peroxide, tagged with  $\text{C}^{14}$  at the  $\alpha$ -carbon atom, was decomposed in boiling  $\text{CCl}_4$ . The propyl chloride thus obtained was hydrolyzed to give propanol which was then oxidized to propionic acid by means of potassium permanganate. Potassium dichromate decomposed propionic acid to acetic acid. Rearrangement could not be observed at the stage of propyl chloride hydrolysis, and must therefore have taken place in the

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Rearrangement of the Free Propyl Radical

SCV/62-59-9-37/40

carbon chain. This is the first time a rearrangement has been observed in simple hydrocarbons.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova, Khimicheskii fakul'tet (Moscow State University imeni M. V. Lomonosov, Department of Chemistry). Akademiya meditsinskikh nauk SSSR (Academy of Medical Sciences, USSR)

SUBMITTED: June 15, 1959

Card 2/2

5(3)

AUTHORS:

Reutov, O. A., Uglova, E. V.

SOV/62-59-9-38/40

TITLE:

Stereochemistry of Electrophilic Substitution at Saturated Carbon Atoms

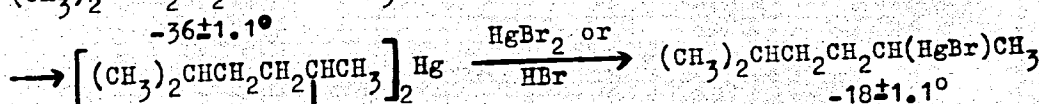
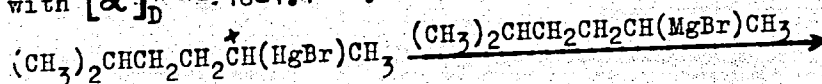
PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 9, p 1691 (USSR)

ABSTRACT:

By investigating the antipodes of asymmetric organomercury compounds the authors (Ref 1) found that the stereochemical configuration of these compounds is retained in substitution at the electrophilically bound asymmetrical carbon atom. This was also observed in the case of 1,4-dimethylpentylmercury bromide, which reacts with magnesium-organic compounds under the influence of  $\text{HgBr}_2$  or  $\text{HBr}$  and gives the same 1,4-dimethylpentylmercury bromide

with  $[\alpha]_D^{18} - 18 \pm 1.1^\circ$ .



$-18 \pm 1.1^\circ$

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Stereochemistry of Electrophilic Substitution at  
Saturated Carbon Atoms

SOV/62-59-9-38/40

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
Khimicheskiy fakul'tet (Moscow State University imeni M. V.  
Lomonosov, Department of Chemistry)

SUBMITTED: June 15, 1959

Card 2/2

COUNTRY : HUNGARY G  
 CATEGORY : Organic Chemistry. General and Theoretical  
 Problems of Organic Chemistry  
 ABS. JOUR. : RZKhim., No. 1 1960, No. 1088  
 AUTHOR : Reutow, O. A.  
 INST. : Hungarian AS  
 TITLE : Investigations of the Mechanisms of Some Substitution Reactions with the Use of Labeled Atoms  
 ORIG. PUB. : Acta chim. Acad. scient. hung., 1959, 16, No 1-4, 439-448  
 ABSTRACT : A review report on the works of the author is given. The discussion bears on the reactions of isotopic exchange of  $R_2Hg$  and  $RHgX$  ( $R =$  alkyl,  $X =$  halide) with  $Hg^{203}$  (homolytic substitution reactions), the reactions of isotopic exchange of  $RHgX$  with  $Hg^{203}X_2$  (electrophilic substitution reactions), the influence of structural factors and conditions of the reaction, the stereochemistry of homolytic and

CARD: 1/2

CARD: 2/2

G-1



AUTHORS: Reutov, O. A., Lu ~~Chin-chin~~

SOV/79-29-1-39/74

TITLE: Stereochemistry of the Reaction of 3-Bromo-Mercury-1-Camphor and 3-Bromo-Mercury-d-Camphor With Sodium Thiosulfate  
(Stereokhimiya reaktsii 3-brommerkur-1-kamfory i 3-brommerkur-d-kamfory s tiosul'fatom natriya)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 1, pp 182-187 (USSR)

ABSTRACT: According to reference 1 it was determined that the symmetrization of diastereomeric 1-methyl esters of the 3-bromo-mercury-phenyl acetic acid with ammonia in chloroform represents a reaction of electrophilic substitution character on the saturated carbon atom and proceeds by maintaining the stereochemical structure. The investigation of the kinetics of this reaction indicated (Ref 2) that it proceeds in two steps (Scheme 1). The first step (a) is a reaction of bimolecular electrophilic substitution character. In connection with that the present paper describes the results of the further investigation of the stereochemistry of symmetrization reaction, on the basis of organomercury derivatives of camphor. The mixture of the diastereomers of 3-bromomercury-1-camphor and the mixture of the diastereomers of 3-bromomercury-d-camphor

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SOV/79-29-1-39/74

## Stereochemistry of the Reaction of 3-Bromo-Mercury-1-Camphor and 3-Bromo-Mercury-d-Camphor With Sodium Thiosulfate

were obtained by mercurization of l- and d-camphor by means of  $K_2HgJ_4$  (Ref 3). From the first mixture two diastereomers of 3-bromomercury-1-camphor were separated by fractional recrystallization, which differ in the structure of the  $\alpha$ -carbon atom (I and II). From the second mixture the diastereomers of 3-bromomercury-d-camphor (III) and (IV) were separated. (I) and (III) are more stable than (II) and (IV). Sodium thiosulfate and hydrazine hydrate proved to be the only symmetrizing agents for all organo-mercury compounds, since with other agents (KJ, KOH, KCNS,  $Na_2S$ , and  $Na_2SnO_2$ ) a cleavage of all C-Hg bonds took place. The transformations of the organomercury derivatives of l- and d-camphor may be represented summarily by the scheme 2. Thus, the reaction proceeds by maintaining the structure. There are 4 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: October 28, 1957  
Card 2/2

SOV/79-29-4-36/77

5(3)

AUTHORS:

Reutov, O. A., Lu Tszin-chzhu

TITLE:

On the Stereochemistry of the Symmetrization Reaction of Some Organo-mercury Derivatives of Camphor Under the Influence of Hydrazine Hydrate (O stereokhimii reaktsii simmetrizatsii nekotorykh rtutnoorganicheskikh proizvodnykh kamfory pod deystviem gidrazin-gidrata)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 4, pp 1207-1213 (USSR)

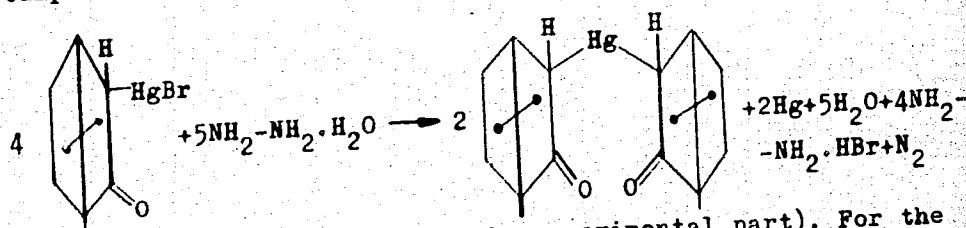
ABSTRACT:

Having previously examined the stereochemistry of the symmetrization reaction of 3-bromine-mercury camphor under the influence of sodium thiosulfate (Ref 1) the authors tried in the present case to perform the same reaction under the influence of hydrazine hydrate. In the article under review the constants of the diastereomers of 3-bromine-mercury-1-camphor and 3-bromine-mercury-d-camphor (I), (II), (III), and (IV) obtained earlier (Ref 1) are listed. The diastereomers (I), (II), and (III) were used in the experiments reported on below. The reaction follows the scheme 1:

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SOV/79-29-4-36/77

On the Stereochemistry of the Symmetrization Reaction of Some Organo-mercury  
Derivatives of Camphor Under the Influence of Hydrazine Hydrate



(details of this synthesis in the experimental part). For the time being this reaction was thus tested on the two diastereomers of 3-bromine-mercury-1-camphor and on one of the diastereomers of 3-bromine-mercury-d-camphor under the influence of hydrazine hydrate. In all cases the racemization of the configuration was found in the  $\alpha$ -carbon atom. This effect may be due either to the stereochemical reaction of symmetrization as such or to the racemization of the organo-mercury end products under the influence of an agent of basic character (hydrazine hydrate). At the contact with a small amount of hydrazine hydrate in dioxane the less stable diastereomer of 3-bromine-mercury-1-camphor is isomerized and forms the stabler diastereomer.

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SOV/79-29-4-36/77

On the Stereochemistry of the Symmetrization Reaction of Some Organo-mercury Derivatives of Camphor Under the Influence of Hydrazine Hydrate

3-methyl-, 3-ethyl-, and 3-benzyl-3-bromine-mercury camphor were synthesized. The symmetrization of 3-benzyl-3-bromine-mercury camphor under the influence of ammonia was investigated. There are 3 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: March 18, 1958

Card 3/3

5 (3)

AUTHORS:

Reutov, O. A., Ostapchuk, G. M.

307/79-29-5-44/75

TITLE:

The Reaction of the Isotopic Exchange Between Aryl-mercury Chlorides and Metallic Mercury Marked by  $Hg^{203}$  (Reaktsiya izotopnogo obmena arilmerkurokhloridov s metallicheskoj rtut'yu, mechennoy  $Hg^{203}$ )

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 5, pp 1614-1617 (USSR)

ABSTRACT:

In a previous paper (Ref 1) the following reaction was described:  $(p-XC_6H_4)_2Hg + Hg \rightleftharpoons (p-XC_6H_4)_2Hg + Hg$ . The reaction rate depended on the substituent X and increased in the following order:  $O_2N < COOC_2H_5 < Cl < H < CH_3 < OCH_3$ . The present paper investigates the reaction  $p-XC_6H_4-HgCl + Hg \rightleftharpoons p-XC_6H_4-HgCl + Hg$ . It took place in a solution of aryl-mercury chloride in anhydrous pyridine at  $60^\circ$  and at 1500 rpm/min approximately of the mixer. After certain intervals samples were taken, the colloidal mercury centrifuged off, the aryl-mercury-chloride precipitated by means of water

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The Reaction of the Isotopic Exchange Between  
Aryl-mercury Chlorides and Metallic Mercury Marked by  $Hg^{203}$

SOV/79-29-5-44/75

acidified with hydrochloric acid, filtered and recrystallized. The substance dissolved again in organic liquid (chloroform, acetone) was dropped on a standard filter, and this thin layer coated with plexiglass lacquer. The radioactivity was determined by means of the counter MS-4. The results of repeated experiments are given in a table. The authors observed a reaction rate higher than that of diaryl compounds as well as an increase in the reaction rate in the order  $O_2H < C_2H_5OCO < < Cl < H, CH_3$ . Since free radicals are not formed in mono-aryl compounds even by irradiating the solution with ultra-violet light, the reaction mechanism is explained by the formation of a four-membered, activated complex:



There are 1 table and 2 references.

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The Reaction of the Isotopic Exchange Between  
Aryl-mercury Chlorides and Metallic Mercury Marked by  $Hg^{203}$  SOV/79-29-5-44/75

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State  
University)

SUBMITTED: April 9, 1958

Card 3/3



5 (3)  
AUTHORS:

Reutov, G. A., Lu Ching-Chu

SOV/19-29-5-45/75

TITLE:

Stereochemistry of the Symmetrization Reactions of 2-Chloro-mercury Camphane Under the Influence of Hydrazine Hydrate and Sodium Stannite (Stereokhimiya reaktsiy simmetrizatsii 2-khlormerkurkamfana pod deystviyem gidrazin-gidrata i stannita natriya)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 5, pp 1617-1626 (USSR)

ABSTRACT:

During the investigation of the symmetrization of 3-bromo-mercury-camphor under the influence of hydrazine hydrate (Ref 1) a racemization was found to take place in all experiments (the authors emphasize that the expressions "racemization" and "maintenance of the configuration" always refer to the asymmetric C-atom bond to Hg). It was not possible to find out whether this effect is due to the stereochemistry of the symmetrization reaction itself, or whether the reaction proceeded under the maintenance of the configuration and the compound was subjected to a secondary racemization under the influence of hydrazine hydrate. Also experiments with 3-alkyl-3-bromomercury derivatives of

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Stereochemistry of the Symmetrization Reactions of  
2-Chloro-mercury Camphane Under the Influence of Hydrazine Hydrate and  
Sodium Stannite

SOV/79-29-5-45/75

camphor were unsuccessful. The experiments were carried on by the authors with mercury compounds of camphane which was formed from  $\alpha$ -pinene. The 2-chloro-mercury-camphanes obtained, however, yielded a difficultly separable mixture of stereoisomers. Therefore  $\beta$ -pinene was chosen as initial substance for the synthesis of 2-chloro-mercury-camphanes which differ only by the configuration of the second carbon atom. By the action of hydrogen chloride bornyl chloride was obtained, and therefrom the mixture of two diastereomers of 2-chloro-mercury-camphane was formed. The diastereomer I isolated therefrom gave  $[\alpha]_D^{18} - 10.1 \pm 1.1^\circ$ , the diastereomer II:  $[\alpha]_D^{18} + 15.4 \pm 1.2^\circ$ . The diastereomer I reacts with hydrazine hydrate under the formation of unstable mercury-bis-camphane which separates metallic mercury already at low temperature. This bis-camphane is an individual diastereomer. With hydrochloric acid and ethanol the pure diastereomer I of 2-chloro-mercury-camphane is

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Stereochemistry of the Symmetrization Reactions of  
2-Chloro-mercury Camphane Under the Influence of Hydrazine Hydrate and  
Sodium Stannite

SOV/79-29-5-45/75

formed again from it. The reaction thus proceeds under the maintenance of the configuration of the C-atom in position 2. The symmetrization of the diastereomer II was carried out in the same way. After splitting the bis-compound the pure diastereomer I is obtained. The diastereomer II is unstable, accordingly, and is transformed into the I-form. With sodium stannate the same reactions were obtained. The maintenance of the configuration unusual for the radical substitution is probably due to the fact that no optical antipodes are concerned but diastereomers which exhibit different stability. The experimental part describes the reactions performed and gives the data of the resultant compounds. There are 10 references, 5 of which are Soviet.

SUBMITTED:

March 29, 1958

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SOV/76-33-1-25/45

5(4)

AUTHORS:

Reutov, O. A., Beletskaya, I. P., Mardaleyshvili, R. Ye.

TITLE:

Reaction Kinetics of the Symmetrization of Organo-Mercury Salts (Kinetika reaktsii simmetrizatsii rtutnoorganicheskikh soley). I. Determination of the Order From the Organo-Mercury Salt of the Reaction of the Symmetrization of Esters of  $\alpha$ -Mercury Bromide Phenylacetic Acid Under the Influence of Ammonia (I. Opredeleniye poryadka po rtutnoorganicheskoy soli reaktsii simmetrizatsii efirov  $\alpha$ -brommerkurfeniluksusnoy kisloty pod deystviyem ammiaka)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 1, pp 152 - 155 (USSR)

ABSTRACT:

On the example of the diastereomeric 1-menthyl esters of the  $\alpha$ -mercury bromide phenyl acetic acid (I) it had already been found earlier (Ref 1) that the symmetrization of organo-mercury salts with ammonia proceeds with a constant stereochemical structure. Winstein (Uinshteyn) (Ref 2) obtained the same results on experiments with a different salt; whereas Hughes and Ingold (Kh'yuz and Ingol'd) assumed that an electrophilic substitution takes place with a constant

Card 1/3

Reaction Kinetics of the Symmetrization of Organo-Mercury Salts. I. Determination of the Order From the Organo-Mercury Salt of the Reaction of the Symmetrization of Esters of  $\alpha$ -Mercury Bromide Phenylacetic Acid Under the Influence of Ammonia

SOV/76-33-1-25/45

structure in the mechanism  $S_E1$  and a change of the structure in  $S_E2$ . Since a progress of the reaction mentioned in the title is doubtful with  $S_E2$ , the reaction kinetics of ethylene and 1-menthyl ester of (I) was investigated with ammonia in the case under discussion. The symmetrization of  $R_1R_2R_3CHgX$  ( $R_1 = C_6H_5$ ,  $R_2 = H$ ,  $R_3 = COOC_{10}H_{19}$ ) took place in absolute chloroform, mixed with ammonia, at  $20^\circ$ . The nephelometric measuring method was used. The concentration of the substances was in the range of  $(6.8-0.85) \cdot 10^{-5}$  mol/ml. The reaction order of  $R_1R_2R_3CHgX$  was determined by the kinetic curves and the initial concentration of (I). The experimental results obtained showed that the symmetrization reaction of  $R_1R_2R_3CHgX$  is of the second order. There are 4 figures, 1 table, and 3 references, 1 of which is Soviet.

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Reaction Kinetics of the Symmetrization of Organo- SOV/76-33-1-25/45  
Mercury Salts. I. Determination of the Order From the Organo-Mercury Salt  
of the Reaction of the Symmetrization of Esters of  $\alpha$ -Mercury Bromide Phenyl-  
acetic Acid Under the Influence of Ammonia

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: July 4, 1957

Card 3/3

5(4)

SOV/76-33-9-12/37

AUTHORS:

Reutov, O. A., Beletskaya, I. P., Mardaleysvili, R. Ye.

TITLE:

Kinetics of the Symmetrization Reaction of Organomercury Salts.  
II. Determination of the Reaction Order of Symmetrization With  
Ammonia of the Esters of  $\alpha$ -Bromo Mercurio Phenyl Acetic Acid  
With Respect to Ammonia

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 9, pp 1962-1968  
(USSR)

ABSTRACT:

In follow-up of a previous report (Ref 1), further investigations were made here concerning the reaction mentioned in the title, with special regard to the reaction order with respect to ammonia (I) as well as the influence exerted by (I) concentration and various additions upon the rate and intensity of symmetrization. Experiments were made in a test tube (Fig 1) with  $1.36 \cdot 10^{-3}$  mol of organomercury salt (II) and (3.28, 2.76, 2.12, 1.60, 1.07)  $\cdot 10^{-3}$  mol (I). The reaction was stopped at various time intervals by the addition of an excess of 0.149 n HCl (with respect to the (I)-amount), and the acid excess was titrated (Table 1). The order of reaction with respect to (I) was determined from the initial reaction rate of (I) as a

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SOV/76-33-9-12/37

Kinetics of the Symmetrization Reaction of Organomercury Salts. II. Determination of the Reaction Order of Symmetrization With Ammonia of the Esters of  $\alpha$ -Bromo Mercurio Phenyl Acetic Acid With Respect to Ammonia

function of its initial square concentration (Tables 2,3). Nephelometric measurements were likewise made, and the values for  $I = f(t)$  are tabulated (Table 4). In both cases, a direct dependence of the initial reaction rate on the initial square concentration of (I) was ascertained. In the symmetrization of (II), (I) is, under prevailing conditions, consumed according to the second order. From the curves  $I = f(t)$  the portion of reacted (II) was found to depend upon the various initial concentrations of (I) (Table 5); it was further ascertained with the titration method that in the case of (II) amounting to  $1.36 \cdot 10^{-3}$  mol and (I) lying below  $4.30 \cdot 10^{-3}$  mol, the reaction intensity is determined by the initial concentration of (I) (Table 6). Additions of a symmetrical compound  $(R_1R_2R_3C^-)_2Hg$  (formed in the course of reaction) (Table 7) showed that when increasing the concentration of these additions the reaction rate is lowered. The symmetrization reaction under investigation is assumed to take place in two stages (1) and (2), where (1) is a bimolecular electrophilic substitution in the

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Kinetics of the Symmetrization Reaction of Organomercury Salts. II. Determination of the Reaction Order of Symmetrization With Ammonia of the Esters of  $\alpha$ -Bromo Mercurio Phenyl Acetic Acid With Respect to Ammonia

saturated carbon atom. It had already been shown (Ref 2) that the symmetrization in question leaves the stereochemical configuration unaltered; thus, a bimolecular reaction of the mentioned kind with preserved stereochemical configuration was established for the first time. There are 6 figures, 7 tables, and 3 references, 2 of which are Soviet.

SUBMITTED: February 21, 1958

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5(2).

AUTHORS:

Nesmeyanov, A. N., Academician,  
Reutov, O. A., Corresponding Member  
AS USSR. Tolstaya, T. P., Ptitsyna, O. A.,  
Isayeva, L. S., Turchinskiy, M. F.,  
Bochkareva, G. P.

SOV/20-125-6-25/61

TITLE:

Organometallic Compounds Prepared From Double Salts of Halogen  
Metals and Halogenoniums (Metalloorganicheskiye soyedineniya  
iz dvoynykh soley galoidnykh metallov i galogenoniyev)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6, pp 1265-1268  
(USSR)

ABSTRACT:

The present paper adds two further types, (III) and (IV), to  
the two rather similar reaction types (I) and (II) of the  
synthesis of organometallic compounds. Hg, Tl, Sn, Pb, As, Sb,  
and Bi may appear as metal  $M^{(n)}$  in the method of diazonium  
double salts (Ref 1); Cu, Zn, Fe, as well as  $M^{(p)} = M^{(n)}$  as  
metal  $M^{(p)}$  for various combinations. In the method of iodonium  
double salts (Ref 2) Hg, Sn, Sb, and Bi were investigated as  
 $M^{(n)}$  which gave a good yield of corresponding organometallic

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of Halogen Metals and Halogenoniums

SOV/20-125-6-25/61

compounds. The same metal  $M^{(n)}$  is usually used as  $M^{(p)}$ , sometimes, however, Zn or Cu. The corresponding decomposition reactions were carried out by the authors in an acetone solution. For this purpose the same metal powder was used as was chosen by O. A. Reutov and O. A. Ptitsyna for diphenyl iodonium salts. The course and the results of these new reactions were found to be completely similar to those of the last-mentioned salts. This is a new confirmation of a similarity of all diaryl halogenoniums. Phenyl mercury iodide with yields of 22 and 35% is produced by decomposition of the double salts of diphenyl chloronium iodide and of diphenyl bromonium iodide with  $HgJ_2$

by powdered copper in acetone at low temperature. Diphenyl-tin-dichloride with yields of 57 and 55% is produced by decomposition of the double salts of diphenyl chloronium- and diphenyl bromonium with  $SnCl_4$  by powdered tin. The decomposition of the

corresponding double salts of antimony powder leads to a mixture of phenyl-dichlorostibine, diphenyl-chlorostibine, and a small quantity of organo-antimony triaryl compounds. Triphenyl bismuth is produced by decomposition of the bismuth-trichloride

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Organometallic Compounds Prepared From Double Salts  
of Halogen Metals and Halogenoniums

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double salts by bismuth powder. According to the analysis it is assumed that the double salts of antimony-trichloride and of bismuth-trichloride form mixtures of the compounds:

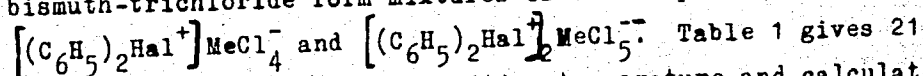


Table 1 gives 21 decomposed salts, the decomposition temperature and calculated as well as actually obtained results of the analysis, table 2 shows the decomposition reactions of the aforesaid double salts with the halides of heavy metals. The double salts of triphenyl-oxonium either do not react at all with the metal powders under the given experimental conditions, or only with a change of the anion part of the double salt. The cation of triphenyl-oxonium is not changed and does not form organometallic compounds. Thus this method is restricted by the inapplicability of oxonium- and (as is expected by analogy) of ammonium salts. The authors finally try to explain this behavior of triphenyl-oxonium salts. There are 2 tables and 11 references, 5 of which are Soviet.

ASSOCIATION:  
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Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University imeni M. V. Lomonosov) Institut

Organometallic Compounds Prepared From Double Salts  
of Halogen Metals and Halogenoniums

SOV/20-125-6-25/61

elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute  
of Elemental-Organic Compounds of the Academy of Sciences USSR)

SUBMITTED: January 7, 1959

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5.3700 (B)(C)

~~SECRET~~

80841

S/026/60/000/04/019/070

DO48/D006

AUTHOR: Reutov, O.A., Corresponding Member

TITLE: The World's Largest School of Metal-Organic Chemists

PERIODICAL: Priroda, 1960, Nr 4, pp 43 - 48 (USSR)

ABSTRACT: On 9 Sep 1959, the 60th birthday of A.N. Nesmeyanov, President of the Akademiya nauk SSSR (Academy of Sciences of the USSR) and his decoration with the Order of Lenin were celebrated. In the present article, the author gives historical data on the development of the synthesis of metal-organic compounds and elucidates A.N. Nesmeyanov's main works on organic chemistry. Nowadays, 15,000 metal-organic compounds are known, of which tetraethyl lead (TEL) ranks first. Lithium- and aluminum-organic compounds are used as catalysts in the production of plastics, and tin-organic compounds as anticorrosive admixtures, plastics stabilizers, catalysts for vulcanization of caoutchouc, bactericides, and fungicides. A.N. Nesmeyanov, and a collective

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DO48/DO06

The World's Largest School of Metal-Organic Chemists

of the Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze (All-Union Scientific Chemical and Pharmaceutical Research Institute imeni S. Ordzhonikidze) has developed a preparation called "diotsid" which possesses an extremely high bactericidal capability. This preparation can be effectively used by surgeons for quick disinfection of their hands prior to operating. Russian chemists A.M. Butlerov, A.M. Zaytsev, S.N. Reformatskiy, N.D. Zelinskiy, Zh.I. Iotsich, and V.V. Chelitsev made valuable contributions to the development of metal-organic chemistry. A.N. Nesmeyanov developed a perfect method of synthesizing metal-organic compounds of heavy metals, known as "Nesmeyanov's diazomethod". The essence of this method is explained by an example of synthesizing mercury-organic compounds. The reaction occurs according to the following formula:

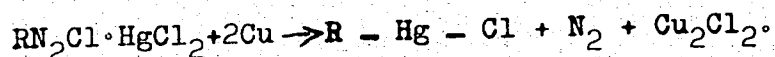
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80841

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With the aid of this reaction, Nesmeyanov and his pupils obtained various organic compounds of mercury, thallium, germanium, tin, lead, arsenic, antimony and bismuth. Hundreds of substances, formerly inaccessible, are now to be obtained by this method. Another synthesis developed in Nesmeyanov's school is the method of mutating one kind of metal-organic compounds into another. The most important of them is the change of mercury-organic into metal-organic compounds of other metals. In nearly all cases the reverse mutation of the metal compounds into mercury-organic compounds has been found. Besides this, Nesmeyanov worked out fundamental theoretical problems of organic chemistry on the basis of metal-organic compounds. The author describes three trends of Nesmeyanov's theoretical works: 1) tautomerism and the

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reactivity of organic compounds; 2) the mechanism of the reactions of carbon atom substitution; 3) the mechanism of formation and disruption of metal combinations - carbon and several other chemical combinations. A.N. Nesmeyanov has proved that double reactivity is not always conditioned by tautomerism but may also depend on other causes. He found and studied several cases of double reactivity when tautomerism was absent. With the aid of theoretical calculations, M.I. Kabachnik has shown that, in general, a pseudorism of molecules does not exist. The results of this work have shown that double reactivity may be caused by special properties in the reacting molecule. In work on the mechanism of the reaction of substitution in a carbon atom, the problems of the stereochemistry of these reactions rank first. Nesmeyanov's school was very successful in explaining the nature of substitution in a carbon atom. The study of the stereo-

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chemistry of substitution in an ethylene carbon atom showed that both the electrophilic and the homolytic substitutions proceeded while the geometrical configuration was maintained (A.N. Nesmeyanov and A.Ye. Borisov). The value of the work on the mechanism of reaction consists in making use of the data obtained for guiding organic reactions in a desired direction. A.N. Nesmeyanov carried out radical and ion breakdown of diazo-compounds and diaryliodonium salts. Each of these types of breakdown has its special features and advantages for the synthesis of metal-organic or organic compounds. The author gives an example of ion breakdown of aryldiazo salts in a medium of chlorobenzene or bromobenzene, which opened the way to the synthesis of organic derivative polyvalent chlorine and bromine. The work on the chemistry of ferrocene (dicyclopentadienyl-iron) has a special place in Nesmeyanov's investigations. The iron-organic compound, discovered 8 years ago,

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is extremely resistant and resembles benzene in many chemical properties. Nesmeyanov's school obtained dozens of ferrocene compounds which may serve as antidetonators, semi-conductors, initial substances for synthesizing polymers, etc. One of the most interesting subjects of Nesmeyanov's investigations in the field of element-organic compounds is the synthesis of "onium" salts (diphenylchloronium and diphenyl-bromonium salts), a direct development of the diazomethod. At the same time, these investigations were connected with his work in the field of organic compounds containing elements in an unusual valent state. Nesmeyanov's investigations into telomerization resulted in the development of the new synthetic fibers "enant" and "pelargon" which are in many ways superior to capron and nylon. Nowadays, A.N. Nesmeyanov heads the world's largest school of metal-organic chemists at the Institut elementoorganicheskikh

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The World's Largest School of Metal-Organic Chemists

soyedineniy AN SSSR (Institute for Element-Organic  
Compounds of the AS USSR) and the Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov). Many of

Nesmeyanov's famous pupils, including M.I. Kabachnik, Corresponding Member of the AS USSR, R.Kh. Freydlina, Corresponding Member of the AMN, N.K. Kochetkov, Doctor of Medical Sciences, A.Ye. Borisov and others are now heads of important scientific institutions.

The following important Soviet centers for investigating metal-organic chemistry are mentioned in this article: the Gor'kovskiy gosudarstvennyy universitet (Gor'kiy State University); the Fiziko-khimicheskiy institut imeni L.Ya. Karpova (Physical and Chemical Institute imeni L.Ya. Karpov) in Moscow. G.A. Razu-

vayev, head of the Gor'kiy University leads investigations into metal-organic compounds of heavy metals. The main subject of these investigations is the breakdown of metal-organic compounds which results

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in the formation of free radicals in solutions. Razuvayev developed several original methods of synthesizing metal-organic compounds, such as the method of synthesizing mercury-organic compounds from organic peroxide and from mercury salts of organic acids. The work of the Physical and Chemical Institute is above all concentrated on compounds of 3rd and 4th group metals of the periodic system and on lithium-organic compounds. The Institute is headed by K.A. Kocheshkov, Nesmeyanov's former co-worker. The latest results in the chemistry of metallocene and carbonyls indicate that metal-organic compounds

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are important as intermediate substances in industrial catalytic processes. There is 1 photograph and 3 references of which 2 are Soviet and 1 English.

ASSOCIATION: AN SSR (AS USSR)

Card 9/9

KAZITSYNA, L.A.; REUTOV, O.A.; BUCHKOVSKIY, Z.F.

Structure of double diazonium salts. Izv.AN SSSR Otd.khim.nauk  
no.8:1523 Ag '60. (MIRA 15:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.  
(Diazonium compounds)

S/062/60/000/009/020/021  
B023/B064

AUTHORS: 1. ~~Reutov, O. A.~~ and Beletskaya, I. P.; 2) Reutov, O. A. and Lovtsova, A. N.; 3. Vinogradova, L. P. and Zav'yalov, S.I.

TITLE: 1. Electrophilic and Radical Substitution of Iodine for the Mercury Atom in Organo-mercury Salts. 2. Introduction of Dichloro Carbene Into the Metal - Haloid Binding. 3. Interaction of 2-Formyl Cycloalkanones With Hydrogen Peroxide

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 9, pp. 1716-1717

TEXT: 1. In the course of their studies of the mechanism of the electrophilic substitution on the saturated carbon atom, the authors investigated the reaction of the organo-mercury salts: ethyl ester of  $\alpha$ -bromo mercury phenyl acetic acid (I) and the benzyl mercury bromide (II) with iodine. The electrophilic substitution of the mercury atom was carried out under the action of iodine in cadmium iodide solution. The reaction took place

in aqueous dioxan:  $R - HgBr + I_2 \xrightarrow{CdI_2} R - I + HgBr I.$

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1. Electrophilic and Radical Substitution of Iodine for the Mercury Atom in Organo-mercury Salts. 2. Introduction of Dichloro Carbene Into the Metal - Haloid Binding 3. Interaction of 2-Formyl Cycloalkanones With Hydrogen Peroxide

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B023/B064

In case (I) the reaction proceeds rapidly, in case (II) much slower. The reaction kinetics of (II) with iodine was spectrophotometrically recorded and examined by the titration method. The reaction proceeds rapidly in the presence of  $CdI_2$ , i.e., photochemically by the radical mechanism. The reaction of (I) with iodine in the absence of  $CdI_2$  (radical reaction) is of first order with respect to iodine and of zeroth order with respect to the organo-mercury salt. The kinetics was spectrophotometrically recorded. Finally, a very important effect of the structural factor upon the rate of the electrophilic and radical substitution of the iodine atom for the mercury atom on saturated carbon was determined. 2. The authors found that the dichloro carbene forming in the benzene medium under the action of tertiary potassium butylate upon chloroform, is capable of linking itself into the mercury - chlorine binding under the formation of trichloro methyl mercury compounds. Sublimate reacts with dichloro carbene under the formation of trichloro methyl mercury chloride (melting point  $180^\circ$ ).

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1. Electrophilic and Radical Substitution of Iodine for the Mercury Atom in Organo-mercury Salts. 2. Introduction of Dichloro Carbene Into the Metal - Haloid Binding. 3. Interaction of 2-Formyl Cycloalkanones With Hydrogen Peroxide

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B023/B064

Found: Hg 56.83%. Calculated: Hg 56.60%. Phenyl mercury chloride forms trichloro methyl phenyl mercury (melting point 113.5-114°). Trans-β-chloro vinyl mercury chloride forms trichloro methyl-trans-β-chloro vinyl mercury (melting point 80-81°). Found 53.06%. Calculated: 52.72%. The latter compound is converted under the action of chlorine or bromine into trichloro methyl mercury chloride or trichloro methyl mercury bromide, respectively. At present, the authors are investigating the possibility of synthesizing trichloro methyl organometallic compounds of other metals with dichloro carbene. 3. The authors found that under the action of hydrogen peroxide at low temperatures 2-formyl cyclopentanone and 2-formyl cyclohexanone undergo an oxidative splitting and yield adipic and pimelic acid, respectively. This rare reaction of 2-formyl cycloalkanones may be used for the production of a variety of dicarboxylic acids, beginning with the cyclic ketones. There are 2 Soviet references.

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1. Electrophilic and Radical Substitution of Iodine for the Mercury Atom in Organo-mercury Salts. 2. Introduction of Dichloro Carbene Into the Metal - Haloid Binding. 3. Interaction of 2-Formyl Cycloalkanones With Hydrogen Peroxide

S/062/60/000/009/020/021  
B023/B064

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova (Moscow State University imeni M. V. Lomonosov), (Reutov, O.A., Beletskaya, I. P., Lovtsova, A. N.), Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences USSR) (Vinogradova, L. P. and Zav'yalov, S.I.)

SUBMITTED: 1. May 23, 1960; 2. June 9, 1960; 3. June 13, 1960

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REUTOV, O. A.

S/078/60/005/05/36/037  
B004/B016

AUTHORS: Tananayev, I. V., Luzhnaya, N. P.

TITLE: The XVII Congress on Pure and Applied Chemistry

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 5, pp. 1178 - 1183

TEXT: The XVII Congress of the IUPAC (International Union of Pure and Applied Chemistry) took place in Munich from July 30 to September 6, 1959. It was preceded by the XX Conference of the IUPAC (August 26-29, 1959) which was attended by a Soviet delegation consisting of B. A. Kazanskiy (re-elected as representative of the USSR at the Bureau of the IUPAC), M. M. Shemyakin (elected as a member of the Section of Organic Chemistry), A. P. Vinogradov (elected as Deputy Chairman of the Section of Geochemistry), I. V. Tananayev (elected as a member of the Section of Inorganic Chemistry), Ya. I. Gerasimov, O. A. Reutov, and G. I. Rakhmaninov. Further, I. P. Alimarin was appointed Second Secretary of the Section of Analytical Chemistry. About 2200 delegates attended the Congress. In a plenary session O. A. Reutov delivered a lecture: "The Mechanism of the Formation of Metal-Carbon Bond and Some Considerations on the Reactivity of Organometallic Compounds of Heavy Metals". ~~Concerning the work of the sections the~~

REUTOV, O.A., PTITSYNA, O.A., ORLOV, S.I.

Synthesis of solid aryl diazonium salts from double aryl diazonium salts of ferric chloride. Vest. Mosk. un. Ser. 2: khim. 15 no.2: 47-49 Mr-Ap '60. (MIRA 13:6)

1. Kafedra organicheskoy khimii Moskovskogo universiteta.  
(Diazonium compounds) (Iron chloride)